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FINAL

PLAN OF ACTION
HANGAR 1000 TANK SYSTEM CLOSURE
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

STATEMENT OF WORK NO. 003
NAVY CLEAN - DISTRICT I
CONTRACT NO. N62467-89-D-0317

SEPTEMBER 1991

Box 13

ABB Environmental Services, Inc.

ASEA BROWN BOVERI

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ASEA BROWN BOVERI

September 25, 1991

Commanding Officer
Southern Division
Naval Facilities Engineering Command
ATTN: Ms. Janet Morris, Code 0232JM
2155 Eagle Drive
Charleston, South Carolina 29411-0068

SUBJECT: Final Plan of Action - Hangar 1000 Tank System Closure (Phase II), Naval Air Station, Jacksonville Florida Statement of Work 015, Navy CLEAN District 1, Contract N62467-89-D-0317

Dear Ms. Morris:

Enclosed is the Final Plan of Action (POA) for the Hangar 1000 Tank System Closure (Phase II) at the Naval Air Station in Jacksonville, Florida. All comments that were received with the revised Statement of Work, and expanded or altered by the negotiations of September 23/24, have been incorporated as appropriate.

Please feel free to call me at (904) 656-1293 with any comments or questions.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

William Lawrence
Task Order Manager

Enclosure

cc: J. Bartku
L. Huffman

ABB Environmental Services, Inc.

2571 Executive Center Circle East
Suite 100
Tallahassee, Florida 32301

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FINAL

PLAN OF ACTION

HANGAR 1000 TANK SYSTEM CLOSURE

NAVAL AIR STATION
JACKSONVILLE FLORIDA

CONTRACT NO. N62467-89-D-0317
SOW No. 015

September 1991

Submitted By:

ABB ENVIRONMENTAL SERVICES, INC.
2571 EXECUTIVE CENTER CIRCLE EAST
TALLAHASSEE, FLORIDA 32301

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I. INTRODUCTION

On September 6, 1990, Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFACENGCOM) contracted with ABB Environmental Services, Inc. (ABB-ES) (contract No. N62467-89-D-0317) to assist the Navy's Environmental Engineering Program by providing engineering support services for the Installation Restoration (IR) Program. The first step in the process of executing a Contract Task Order (CTO) is for ABB-ES to respond to a Statement Of Work (SOW) by participating in a site visit to define the SOW and to develop a Plan of Action (POA). The Plan of Action presents a description of the scope of services, a schedule showing the duration of the tasks, and estimated costs associated with the defined tasks.

This POA describes the scope of services, presents Gantt schedules, and provides cost estimates for SOW 015 (Phase II of CTO-003) for the Hangar 1000 tank system closure. This SOW includes the following tasks:

- Management Activities

  Management responsibilities include: cost tracking, internal and external cost reporting, communication, and deliverable processing and review. Level of effort estimates for these activities are included in estimates for each task. Monthly progress reporting is considered separately under Task 1.

  Task 1 - Monthly Progress Reports

- Technical Activities

  Task 2 - Field Investigation

  - 2.1 Installation of Groundwater Monitoring Wells
  - 2.2 Soil and Groundwater Sampling and Analysis
    - 2.2.1 Groundwater Sampling and Analysis
    - 2.2.2 Initial Soil Sampling and Analysis
    - 2.2.3 Additional Delineation Soil Sampling and Analysis
  - 2.3 Aquifer Testing

  Task 3 - Bi-Monthly Groundwater Elevation Measurement

  Task 4 - Data Validation, Evaluation and Reporting

  Task 5 - Risk Assessment and Reporting

  Task 6 - Closure Plan

The following sections present the scope of services (Section II), key personnel (Section III), schedule (Section IV), and cost estimates for each task (Section V).

II. SCOPE OF SERVICES

Task 1 - Monthly Progress Reports

ABB-ES will prepare Technical/Financial Monthly Reports (TFMR) for the duration of the project in accordance with the provisions of Part V, Section 3 of the contract. Each report will be in the format required in the contract (Part IX, Attachment A) and will summarize activities performed, any problems encountered, and proposed problem resolutions. It will also include a schedule update in the form of a Gantt chart. ABB-ES will notify SOUTHDIV immediately upon discovery of any significant new site conditions, including imminent hazard or substantial endangerment, and any deviation from the project schedule, plan, or budget.

This cost estimate reflects the preparation of 8 monthly reports for this purpose.

The level of effort (LOE) estimated for this task include: Task Order Manager (8 days) and Program Assistant (8 (4-hour) days).

Task 2 - Field Investigation

The field investigation consists of the following subtasks:

2.1 Installation of Groundwater Monitoring Wells
2.2 Groundwater and Soil Sampling and Analysis
  2.2.1 Groundwater Sampling and Analysis
  2.2.2 Initial Soil Sampling and Analysis
  2.2.3 Additional Delineation Soil Sampling
2.3 Aquifer Testing.

All of these subtasks are to be performed during a single field effort, commencing after FDER approval of the QAPP and GWMP. Descriptions of the scope of each subtask are presented in the following text. Level of effort estimates for the task as a whole are presented at the end of subtask 2.3.

Task 2 of this POA has been developed in accordance with the June 1991 Draft Groundwater Monitoring Plan (GWMP), the March 1991 Draft site-specific Quality Assurance Project Plan (QAPP), the ABB-ES Corporate CompQAP, the site-specific Health and Safety Plan (HASP) and the CLEAN Generic HASP. The Draft GWMP and site-specific QAPP are currently being review by the Florida Department of Environmental Regulation (FDER). This POA and the corollary schedule and cost estimates may need to be revised if FDER's comments impact the scope of work defined in these documents.

In general, all work performed under Task 2 of this POA will be performed in accordance with the Final GWMP, the Final site-specific QAPP, the site-specific HASP, the ABB-ES Corporate CompQAP, and the CLEAN Generic HASP.

Task 2.1 - Installation of Groundwater Monitoring Wells

Prior to subsurface drilling, ABB-ES will coordinate with NAS JAX personnel to locate underground utility lines and other subsurface (or overhead) structures that may obstruct drilling activities. ABB-ES will also coordinate with drilling subcontractor personnel and NAS JAX personnel to obtain permits, access, and authorizations, as required, to enter the site and perform the necessary field activities.

A total of four groundwater monitoring wells will be installed to provide a mechanism for sampling and analyzing the shallow aquifer underlying the Hangar 1000 underground tanks. One well will be installed hydraulically upgradient to obtain background samples (i.e., samples outside the influence of the facility). Three wells will be installed downgradient of, and in the immediate vicinity of the Hangar 1000 tanks to ensure that they can intercept the migration of effluent from the tanks, if any. During monitoring well installation, continuous spilt-spoon samples will be collected beginning at a depth of 5 feet below ground surface to a depth of 2 feet below the water table. Split-spoon samples will be collected lithologic and chemical analysis as described in subtask 2.2.

The monitoring wells will be installed in accordance with the "Southern Division Naval Facilities Engineering Command Guidelines For Groundwater Monitoring Well Installation". Monitoring wells will be constructed of 4-in ID, flush-joint, Schedule 40 PVC, with standard 0.010-inch machine-slotted well screens. Polyvinyl chloride is generally accepted as compatible with potential contaminants at this site. The wells will be constructed with 10-foot well screens extending approximately 3 feet above the water table and 7 feet below. A 98 percent pure silica sandpack will be installed in the annulus between the well screen and the borehole wall from approximately 2 feet below to approximately 2 feet above the screen. A 2-foot-thick bentonite seal will be placed on top of the sandpack. The remaining annular space will be backfilled to the surface with a cement/bentonite mixture. A flush-mounted steel well cover with a brass, corrosion-resistant padlock will be placed over the top of each well to protect it from infiltration and human tampering. The ground surface surrounding each well will be completed with a 3 x 4 x 0.5 foot concrete pad. Monitoring well installation plans will be reviewed by a professional geologist and on-site installation will be coordinated by a qualified geologist.

A wellhead elevation survey will be performed by a professional surveyor to obtain horizontal and vertical control of well location and elevation (relative to MSL). Elevations will be consistently recorded from the north side of the casing to provide a constant reference location for the collection of water level measurements. A reference mark will be placed on each wellhead for precise water level measurements.

Water level measurements will be made from the reference mark, using a steel tape calibrated to hundredths of a foot. The tape will be decontaminated prior to use and between each well measurement, with an Alconox and water wash followed by a tap water rinse.

Borehole cuttings, rinse water, and well development water will be disposed in accordance with the site-specific Quality Assurance Project Plan (QAPP), the ABB-ES Florida Operations Comprehensive Quality Assurance Plan (CompQAP), and as described in Section 4.0 of the GWMP. Decontamination, well purging, and soil and groundwater sampling will also be conducted in accordance with the site-specific QAPP, the CompQAP, and as described in Section 4.0 of the GWMP.

Task 2.2 - Groundwater and Soil Sampling and Analysis

The procedures and techniques used for sample collection, sample preservation and shipment, analytical procedures, and chain-of-custody control are described in the GWMP and the site-specific QAPP. The GWMP conforms with 40 CFR Part 265.92 except as modified by site-specific requirements. Modifications include:

- Groundwater monitoring will begin within 30 days after installation of the monitoring system.

- Monitoring wells will initially be sampled once to obtain data for a Risk Assessment. Water level elevations will be recorded once every two months for the first year to obtain information concerning seasonal fluctuations in the surficial aquifer.

- The initial round of groundwater samples will be analyzed for the following quality indices and potential contaminants:

  pH (150.1) and specific conductance (120.1); 4 replicate analyses per sample
  Volatile Organics (8240)
  Semi-volatile Organics (8270)
  Selected Metals: cadmium, chromium, lead, and barium (6000/7000 series)

  USEPA analytical methods will be used as described in detail in USEPA SW-846 (USEPA, 1986). Samples will be analyzed and validated in accordance with NEESA Level C quality assurance/quality control (QA/QC) requirements. These analyses were selected based on an evaluation of previous analytical results and potential waste sources.

- If analytes are detected above quantitation limits, the monitoring well containing the highest concentrations will be re-sampled and analyzed for Appendix IX parameters (RCRA 40 CFR Part 264, Appendix IX).

- Soil samples will be collected and analyzed to provide data for potential exposure scenarios addressed in the Risk Assessment. Split-spoon soil samples will be collected concurrently with the installation of the monitoring wells. The soil samples will be analyzed for the same parameters as the groundwater (volatile organics, polynuclear aromatic hydrocarbons, and selected metals: cadmium, chromium, lead, and barium).

For the purposes of comparison during data evaluation for the Risk Assessment, analytical results from the upgradient soil boring/monitoring well will be considered background values. In addition, metal concentrations will be compared

to published literature values for natural background concentration in soils, surface waters and/or groundwater in the southeastern United States.

2.2.1 Groundwater Sampling and Analysis

Within 30 days of installation of the monitoring wells, one round of groundwater samples will be collected for laboratory analysis. For costing purposes it will be assumed that this round of sampling is concurrent with monitoring well installation (i.e., no additional travel costs). Each well will be purged and sampled in accordance with the GWMP. Each sample and the associated QA/QC samples will be analyzed for the parameters outlined above and in Table 1.

2.2.2 Initial Soil Sampling and Analysis

Continuous spilt-spoon samples will be collected beginning at a depth of 5 feet below ground surface to a depth of 2 feet below the water table. Lithologic description of each split-spoon will be recorded. A composite sample from each interval will be analyzed for volatile compounds using a field gas chromatograph (GC) equipped with a photoionization detector (PID) and an electron capture detector (ECD). Standard compounds for this screening analysis will include a representative mixture of contaminants detected or suspected in previous investigations. Previously detected or suspected volatile compounds include: benzene, ethylbenzene, toluene, xylenes, 1,1-dichloroethane, 1,1-dichloroethylene, 1,1,1-trichloroethane, trichlorethylene, tetrachloroethylene, and trichlorotrifluoroethane. Naphthalene, a semi-volatile compound, may also be added as a standard compound as it is a common constituent of fuels and was also detected in previous sampling events.

This GC screening will be used to select sample intervals for laboratory analysis and to aid in "real-time" delineation of potential soil contamination. Soil samples from each interval will be collected and stored on ice until receipt and evaluation of GC results. Samples with the highest GC concentrations will be selected for analysis. At a minimum, two samples will be collected for analysis from each boring. If no samples show evidence of contamination, samples will be collected from the 5 to 7 foot interval and from the 10 to 12 foot interval to ensure collection of samples above and below the level of the tank.

Soil sample collection equipment will be decontaminated prior to use and in between each sample as described in the GWMP Section 4.1.2.1 "Decontamination Procedures". Soil samples will be collected, preserved and documented as described in the GWMP Sections 4.1.2.5, 4.2 and 4.5 respectively. Laboratory analyses will be performed as described below and as discussed in the GWMP Section 4.4 "Analytical Parameters".

Soil samples will be collected concurrent with monitoring well installation. Each sample and the associated QA/QC samples will be analyzed for the parameters outlined above and in Table 2.

2.2.3 Additional Delineation Soil Sampling

In addition to the soil and groundwater sampling described in the GWMP, extra soil boring and sampling may be performed to provide additional characterization

Table 1

Laboratory Analytical Parameters for
Groundwater and NEESA Level C QA/QC Samples

Hangar 1000 Tank Closure
NAS Jacksonville Florida

Sample	Water Quality Parameters[1]	Volatile Organics	Semi-Volatile Organics	Cadmium	Chromium (III)	Chromium (VI)	Lead	Barium
Groundwater	16	4	4	4	4	4	4	4
Duplicate	0	1	1	1	1	1	1	1
Trip Blank	0	1	0	0	0	0	0	0
Rinsate Blank	0	1	1	1	1	1	1	1
Matrix Spike	0	1	1	1	1	1	1	1
Matrix Spike Duplicate	0	1	1	1	1	1	1	1
Total	16	9	8	8	8	8	8	8

[1] Water Quality Parameters includes pH and specific conductance and four replicate analyses of each are required per sample.

Table 2
Laboratory Analytical Parameters for
Soil and NEESA Level C QA/QC Samples

Hangar 1000 Tank Closure
NAS Jacksonville Florida

Sample	Water Quality Parameters[1]	Volatile Organics	Semi-Volatile Organics	Cadmium	Chromium	Lead	Barium
Soil	8	8	8	8	8	8	8
Duplicate	1	1	1	1	1	1	1
Trip Blank	0	1	0	0	0	0	0
Rinsate Blank	0	1	1	1	1	1	1
Matrix Spike	0	1	1	1	1	1	1
Matrix Spike Duplicate	0	1	1	1	1	1	1
Total	9	13	12	12	12	12	12

[1] Water Quality Parameters for soil includes pH only and only one analysis per sample.

and/or delineation of potential soil contamination. The location and actual number of additional borings will depend on GC screening results (described above). If an area (or areas) of potential contamination is identified through GC screening, additional borings may be added in the presumed downgradient direction. Ideally, borings will be added until the extent of contamination can be defined through surrounding "clean" boring samples.

For the purposes of this cost estimate, 5 additional 12-foot deep soil borings will be added with continuous split-spoon sampling from 5 to 12 feet below land surface. Based on the analysis results of these five additional samples, additional samples may be required to further delineate the contaminated area. Samples from each split-spoon interval will be screened on a field GC as described above. For the purposes of this estimate, a minimum of two soil samples from each boring will be collected for laboratory analysis.

This additional soil sampling will be performed concurrent with previously described soil borings and monitoring well installation. Each sample and the associated QA/QC samples will be analyzed for the same parameters as previous soil and groundwater samples, as outlined above and in Table 3.

Task 2.3 - Aquifer Testing

Hydraulic conductivity tests (slug tests) will be performed in each of the four monitoring wells in accordance with USEPA Method 9100, Section 3.0 Field Methods. In general, the test consists of the introduction and withdrawal of either a slug of water or of a weight (such as a tube filled with sand), and the measurement of the change in water level, or fluid pressure, in the well over time. The data will be analyzed using a method developed by H. Bouwer and R.C. Rice (Water Resources Research, Vol. 12, No. 3., June 1976) for calculating the hydraulic conductivity of an aquifer from partially penetrating wells in an unconfined aquifer.

Level of Effort and Cost Assumptions for Task 2

For costing purposes, a total depth of 19 feet will be assumed for the 4 monitoring well boreholes and 4 split-spoon samples will be assumed for each borehole. The actual depth and number of sampling intervals will depend on site-specific factors such as the depth to the water table, subsurface conditions and borehole stability. A total depth of 13 feet has been assumed for the 5 additional delineation soil borings, with an estimated 4 split-spoon samples per borehole.

The LOE for this task assumes a total of 2 people in the field for 10 (10-hour) days (includes travel time). In addition, 2 (8-hour) days have been allotted for fieldwork preparation and 1 (8-hour) day has been added for internal scheduling and subcontractor coordination.

Other direct costs (ODCs) include: drilling, surveyor and laboratory subcontractors, federal express shipment of sample coolers, expendable items, field van rental, hotel and per diem.

Table 3
Laboratory Analytical Parameters for
Additional Soil and NEESA Level C QA/QC Samples

Hangar 1000 Tank Closure
NAS Jacksonville Florida

Sample	Water Quality Parameters[1]	Volatile Organics	Semi-Volatile Organics	Cadmium	Chromium	Lead	Barium
Soil	10	10	10	10	10	10	10
Duplicate	1	1	1	1	1	1	1
Trip Blank	0	1	0	0	0	0	0
Rinsate Blank	0	1	1	1	1	1	1
Matrix Spike	0	1	1	1	1	1	1
Matrix Spike Duplicate	0	1	1	1	1	1	1
Total	11	15	14	14	14	14	14

[1] Water Quality Parameters for soil includes pH only and only one analysis per sample.

The personnel and LOE estimated for this task include: Senior Scientist (8 (10-hour) days plus 2 (8-hour) days, Geologist (8 (10-hour) days), Task Order Manager (3 days), Project Assistant (1 day) and Draftsperson (1 day).

Task 3 - Bi-Monthly Groundwater Elevation Measurements

As suggested by FDER, water level elevations will be measured in accordance with the GWMP once every two months for a period of one year to obtain information concerning seasonal fluctuations in the surficial aquifer. The first round of measurement will coincide with monitoring well installation and will be included as a part of the cost for Task 2. The remaining 5 rounds will be assumed to be separate trips.

Level of Effort and Cost Assumptions for Task 3

The LOE for this task assumes 5 separate trips to the facility. Each trip is assumed to be 14-hours which includes time for: equipment preparation, travel (approximately 6 hours round trip), time to get clearance for site access and time to perform the work.

The key personnel and LOE estimated for this task include: Geologist (5 (14-hour) and Task Order Manager (1 day).

Other direct costs (ODCs) include: expendable items, car rental and per diem.

Task 4 - Data Validation, Evaluation and Reporting

Laboratory analysis and data validation will be performed in accordance with NEESA Level C data quality objectives (DQOs) as described in "Sampling and Chemical Analysis Requirements for the Navy Installation Restoration Program" (NEESA 20.2-047B June 1988). Data validation includes a systematic review of laboratory data and QA/QC measures such as holding times, blank analyses, surrogate recoveries, matrix spike results, GC/MS tuning, instrument calibration, compound identification and method performance. Raw laboratory data will be marked with validation qualifiers or annotations. The validated data is then used for data evaluation.

Data evaluation involves preparation of data summary tables, plotting data on scaled maps or cross-sections and analyzing both laboratory data and physical data (i.e., direction of groundwater flow, subsurface lithology, etc.) to assess contaminant distribution and potential mechanisms of transport.

If surficial groundwater contamination is evident after evaluation of laboratory data, the scope, schedule and budget presented in this POA may need to be revised to include installation and sampling of at least one deep well screened in the regional drinking water aquifer (the Floridan aquifer system). The potential need for a deep well was suggested by Florida Department of Environmental Regulation (FDER) representatives during a March 19, 1991 meeting. Sampling of the Floridan aquifer may be required to provide evidence that the shallow groundwater contamination has not migrated into drinking water supplies.

A Draft Contamination Assessment Report will be prepared for review and comment by SOUTHDIV and the NAS Jacksonville facility. This report will include sections pertaining to: site background and history, monitoring well and soil boring installation, groundwater and soil sample collection, aquifer testing, laboratory analysis, and data evaluation. A Final report will be issued incorporating SOUTHDIV and the facility review comments. The Draft and Final reports will be distributed as outlined in the SOW.

Level of Effort and Cost Assumptions for Task 4

The LOE for data validation includes: Quality Assurance Assistant (8 days), Quality Assurance Manager (5 days), Task Order Manager (3 days) and Clerical (1 day).

The LOE for data evaluation (including data manipulation and preparation of summary tables) includes: Senior Scientist (10 days), Geologist (5 days), Quality Assurance Assistant (4 days), Quality Assurance Manager (1 day), Task Order Manager (5 days), Clerical (4 days), Draftsperson (3 days) and Project Assistant (2 days).

The LOE for Draft and Final report development includes: Senior Scientist (10 days), Geologist (5 days), Quality Assurance Assistant (1 day), Task Order Manager (4 days), Technical Expert/Reviewer (1 day), Technical Editor (1 day), Clerical (5 days), Draftsperson (1 day) and Project Assistant (2 days).

The assumptions for and estimates of ODCs for Draft and Final report development include: each report will be assumed to be one volume with approximately 150 pages (including copies of laboratory and QA/QC data), a total of 20 copies will be produced and bound in a 3-ring binder, and approximately 5 express mail shipments will be assumed.

Task 5 - Risk Assessment and Reporting

A human health risk assessment will be performed in accordance with the following USEPA guidance documents: "Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual (Part A)", and "Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors". The media, exposure factors, target risk levels, absorption factors and ingestion rates used will be as determined in a meeting between representatives from the Florida Department of Environmental Regulation (FDER), representatives of NAS Jacksonville, and ABB-ES (see March 19, 1991 meeting minutes). This meeting will take place shortly after FDER has received and reviewed the draft Risk Assessment and Closure Plans.

A risk assessment specialist will visit the site during the field investigation to gather data and/or observations concerning potential exposure scenarios (for example, data concerning the local use of the shallow aquifer, interviews concerning planned construction activities and durations for the keyway, etc.) The risk assessment will consist of the following steps: data evaluation and summarization, identification of contaminants of potential concern, exposure assessment, toxicity assessment, risk characterization, development of target levels and report preparation.

A comprehensive Draft report will be prepared for review and comment by SOUTHDIV and the NAS Jacksonville facility. This report will combine the contamination assessment report and the risk assessment into a comprehensive assessment Report. An Interim-Draft report will incorporate SOUTHDIV and the facility review comments. A Draft Final report will be prepared, incorporating final Navy review comments will be prepared for submission to FDER. A Final Report wil be issued to incorporate FDER comments. Draft, Interim Draft, Draft Final, and Final documents will be distributed as outlined in the SOW.

An additional meeting between the SOUTHDIV Engineer-in-Charge and FDER and ABB-ES risk assessment specialists and task order managers may be beneficial after report development and prior to Closure Plan development. For costing purposes, this meeting will be assumed to be held in Tallahassee Florida at the FDER headquarters.

Level of Effort and Cost Assumptions for Task 5

The LOE for the site visit includes: Public Health Specialist/Senior Scientist (4 days), Task Order Manager (1 day) and Clerical (1 day). The ODCs for the site visit includes: round-trip airfare (Wakefield MA to Jacksonville FL), expendables, hotel and per diem.

The LOE for the risk assessment includes: Public Health Specialist/Senior Scientist (10 days), Quality Assurance Asistant (2 days), Technical Expert/Reviewer (1 day), Task Order Manager (1 days), Clerical (3 days), Draftsperson (2 days) and Project Assistant (2 days).

The LOE for Draft, Interim-Draft and Final report development includes:Public health Specialist/Senior Scientist (10 days), Task Order Manager (3 days), Technical Expert/Reviewers (2 at 1 day each), Clerical (5 days), Draftsperson (1 day) and Project Assistant (2 days).

The assumptions for and estimates of ODCs for Draft, Interim-Draft and Final report development include: each report will be assumed to be one volume with approximately 300 pages (including copies of laboratory and QA/QC data), a total of 25 copies will be produced and bound in a 3-ring binder, and approximately 7 express mail shipments will be assumed.

The LOE for the pre-Closure Plan meeting includes: Public Health Specialist/Senior Scientist (2 days), Task Order Manager (2 days) and Clerical (1/2 day). The estimates for ODCs for this meeting assume: round-trip airfare from Wakefield MA to Tallahassee FL, per diem and hotel.

Task 6 - Closure Plan

A revised Closure Plan will be developed to address steps necessary to achieve closure of the tank system. If the risk levels posed by existing contamination are deemed unacceptable, the closure plan will present removal, monitoring and/or other actions that may be required for closure and post-closure in accordance with applicable state and federal regulations. To the extent possible, the closure and post-closure activities proposed will accommodate the facility's plan

to use the keyway as a storage area. The revised Closure Plan will contain sufficient detail of proposed actions to allow the preparation of design plans and specifications upon receipt of approval of the plan by the Contraction Officer and FDER. Preparation of design documents can be performed under a subsequent modification or addition to this contract.

A Draft Closure Plan will be prepared for review and comment by SOUTHDIV and the NAS Jacksonville facility. An Interim-Draft report will incorporate SOUTHDIV and the facility review comments for delivery to FDER. A Final report will be prepared to incorporate FDER comments. Draft, Interim Draft and Final documents will be distributed as outlined in the SOW.

Level of Effort and Cost Assumptions for Task 6

The LOE for the development of the Draft, Interim-Draft and Final Closure Plan includes: Senior Scientist (15 days), Senior Engineer (5 days), Geologist (5 days), Task Order Manager (8 days), Technical Expert/Reviewer (1 day), Technical Editor (2 days), Clerical (7 days), Draftsperson (5 days).

The assumptions for and estimates of ODCs for Draft, Interim-Draft and Final report development include: each report will be assumed to be one volume with approximately 100 pages, a total of 25 copies will be produced and bound in a 3-ring binder, and approximately 7 express mail shipments will be assumed.

III. KEY PERSONNEL

The designated roles for the tank system closure at NAS Jacksonville are as follows:

- Program Manager. The Program Manager, Tony Allen, is responsible for oversight and management of the overall multi-installation Navy CLEAN contract for District I. In this position, Mr. Allen is able to identify overall program needs, promote technology and other information transfer between various Navy CLEAN projects, and direct resources as appropriate, for effective and timely completion of program activities.

- Task Order Manager. The Task Order Manager for the tank system closure will be Mr. Bill Lawrence. Mr. Lawrence is responsible for evaluating the appropriateness and adequacy of the technical or engineering services provided for the property assessment and for developing the technical approach and LOE required to address each of the Plan of Action tasks. Mr. Lawrence is also responsible for the day-to-day conduct of the work, including the integration of the input of supporting disciplines and subcontractors. He will review the on-going quality control during the performance of the work, the technical integrity of conclusions and recommendations, and the clarity and usefulness of all project work products.

  Specific responsibilities of this role include:

  - overall technical responsibility for the project;

- initiating project activities;
- participating in the work plan preparation and staff assignments;
- identifying and fulfilling equipment and other resource requirements;
- monitoring task activities to ensure compliance with established budgets, schedules, and scope of work; and
- regularly interacting with the EIC, the Program Manager, and others as appropriate, on the status of the project.

- Quality Review Board. A Quality Review Board comprised of senior technical staff from the ABB-ES team will assist the Task Order Manager by providing review of the laboratory analytical aspects of the project to assure they are produced in accordance with corporate policy, and meet the requirements of U.S. Navy Southern Division.

  Barbara Callahan, Ph.D. and Roy Koster, P.E. will comprise the ABB-ES technical quality review board and will be actively involved in assuring the quality and appropriateness of methodologies and results.

- Other Key Technical Team Members. David Daniel will be the field team leader for this project. Mr. Daniel has considerable training and experience in hydrogeologic and contamination assessments. His primary responsibilities include oversight of field activities, data interpretation, and report development.

- Contract Manager. The position of contract manager is established because of the importance of day-to-day scope, schedule and budget monitoring for the project between ABB-ES and SouthDiv contracts. It is expected that program decisions will be occurring frequently. Therefore, it is necessary to anticipate and immediately implement contractual actions (i.e., amend subcontracts, initiate procurement actions, etc.) to carry out the program plans. Laurie Huffman will be responsible to the Task Order Manager and will be the principal communication link to the U.S. Navy Southern Division contract officer. Three specific tasks for which Ms. Huffman will be responsible are the following:

  - establish and oversee all subcontract actions to support the project;
  - review technical/financial monthly reports for contractual conformance;
  - ensure that appropriate financial record and reporting requirements are met.

IV. SCHEDULE

Attachment A includes a Gantt chart presenting the proposed schedule for completion of the tasks described above. Additionally, a milestone report is included presenting the key deadline dates in the project. These schedules assume receipt of Notice to Proceed on October 1, 1991. If this date changes, scheduled dates must change proportionally.

V. COST

Attachment B (Table 1 and the fee itemization form) presents the cost estimate to complete the scope of services described herein.

VI. FEE ITEMIZATION FORM SCOPE LIMITATION

The purpose of this paragraph is to clearly define the scope and assumptions made for this fee proposal should it be necessary to enact provisions delineated at Part VII, Para. 22 of the subject contract in accordance with FAR 5243-2.

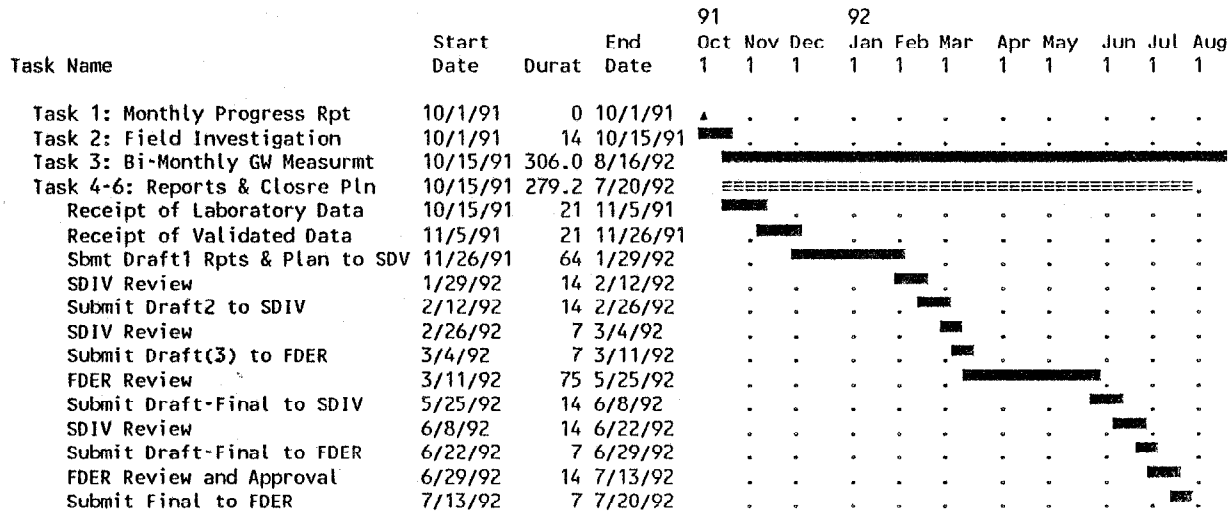
Specific Parameters:
As outlined specifically in Tasks 1 through 4 of this Plan of Action dated August 16, 1991.

Period of Performance Parameters:
Costs presented are estimated to be incurred through October 1992.

ATTACHMENT A

SCHEDULE

Schedule Name: Hangar 1000 - Phase II CTO-003 (SOW-015)
Responsible : W. Lawrence
As-of Date : 9/25/91 1:00pm Schedule File : PH2H1000



Task Name	Start Date	Durat	End Date
Task 1: Monthly Progress Rpt	10/1/91	0	10/1/91
Task 2: Field Investigation	10/1/91	14	10/15/91
Task 3: Bi-Monthly GW Measurmt	10/15/91	306.0	8/16/92
Task 4-6: Reports & Closre Pln	10/15/91	279.2	7/20/92
Receipt of Laboratory Data	10/15/91	21	11/5/91
Receipt of Validated Data	11/5/91	21	11/26/91
Sbmt Draft1 Rpts & Plan to SDV	11/26/91	64	1/29/92
SDIV Review	1/29/92	14	2/12/92
Submit Draft2 to SDIV	2/12/92	14	2/26/92
SDIV Review	2/26/92	7	3/4/92
Submit Draft(3) to FDER	3/4/92	7	3/11/92
FDER Review	3/11/92	75	5/25/92
Submit Draft-Final to SDIV	5/25/92	14	6/8/92
SDIV Review	6/8/92	14	6/22/92
Submit Draft-Final to FDER	6/22/92	7	6/29/92
FDER Review and Approval	6/29/92	14	7/13/92
Submit Final to FDER	7/13/92	7	7/20/92

Detail Task ≡≡≡≡≡ Summary Task °°°°° Baseline
(Progress) ≡≡≡≡≡ (Progress) ▸▸▸ Conflict
(Slack) ≡≡≡— (Slack) Resource delay
Progress shows Percent Achieved on Baseline ▲ Milestone
---------- Scale: 7 days per character ----------

TIME LINE Gantt Chart Report, Strip 1

ATTACHMENT B

COST ESTIMATE

COST SUMMARY (August 1991)
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER	48	$25.50	$1,224.00
TASK ORDER MANAGER	328	$29.00	$9,512.00
SENIOR ENGINEER	40	$29.00	$1,160.00
SENIOR SCIENTIST	584	$29.10	$16,994.40
ENGINEER		$18.50	
GEOLOGIST	254	$19.00	$4,826.00
HYDROLOGIST		$20.00	
TOXICOLOGIST	168	$18.00	$3,024.00
PROJECT ASSISTANT	104	$13.00	$1,352.00
CLERICAL/WORD PROCESSING	196	$10.00	$1,960.00
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR	24	$13.26	$318.24
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT	104	$19.71	$2,049.84
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON	104	$10.50	$1,092.00
TECHNICAL EXPERT	16	$35.00	$560.00
SUBTOTAL DIRECT LABOR	1970		$44,072.48
OVERHEAD	44072.48	0.3312	$14,596.81
FRINGE	58669.29	0.5413	$31,757.68
G&A – LABOR	90426.96	0.0733	$6,628.30
TOTAL LABOR			$97,055.27
AIRFARE			$1,302.00
CAR/FUEL		$50.00	$700.00
FIELD VAN/FUEL		$80.00	$800.00
PER DIEM		$26.00	$754.00
LODGING		$42.00	$546.00
SUBTOTAL TRAVEL			$4,102.00
G&A – TRAVEL	4102	0.0733	$300.68
TOTAL TRAVEL			$4,402.68
PHONE & TELEX		$5.00	$430.00
SHIPPING			$1,550.00
EQUIPMENT			
EXPENDABLES			$150.00
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$2,130.00
G&A – OTHER DIRECT COSTS	2130.00	0.0733	$156.13
TOTAL OTHER DIRECT COSTS			$2,286.13
SUBCONTRACT			
DRILLING			$8,524.00
LABORATORY			$30,670.50
SURVEY			$3,200.00
REPORT COPY AND BINDING			$994.05
SUBTOTAL SUBCONTRACT			$43,388.55
G&A – SUBCONTRACT	43388.55	0.0733	$3,180.38
TOTAL SUBCONTRACT			$46,568.93
TOTAL COST			$150,313.00
AWARD FEE – LABOR, TRAVEL, ODC	103744.0	0.1	$10,374.41
AWARD FEE – SUBCONTRACT	46568.93	0.045	$2,095.60
TOTAL PRICE			$162,783.01

TASK: Task 2 – Field Investigation
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER		$25.50	
TASK ORDER MANAGER	24	$29.00	$696.00
SENIOR ENGINEER		$29.00	
SENIOR SCIENTIST	96	$29.10	$2,793.60
ENGINEER		$18.50	
GEOLOGIST	80	$19.00	$1,520.00
HYDROLOGIST		$20.00	
TOXICOLOGIST		$18.00	
PROJECT ASSISTANT	8	$13.00	$104.00
CLERICAL/WORD PROCESSING		$10.00	
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR		$13.26	
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT		$19.71	
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON	8	$10.50	$84.00
TECHNICAL EXPERT		$35.00	
SUBTOTAL DIRECT LABOR	216		$5,197.60
OVERHEAD	5197.6	0.3312	$1,721.45
FRINGE	6919.05	0.5413	$3,745.28
G&A – LABOR	10664.32	0.0733	$781.69
TOTAL LABOR			$11,446.02
AIRFARE			
CAR/FUEL		$50.00	
FIELD VAN/FUEL	10	$80.00	$800.00
PER DIEM	10	$26.00	$260.00
LODGING	9	$42.00	$378.00
SUBTOTAL TRAVEL			$1,438.00
G&A – TRAVEL	1438	0.0733	$105.41
TOTAL TRAVEL			$1,543.41
PHONE & TELEX	10	$5.00	$50.00
SHIPPING (12 sample coolers)	12	$75.00	$900.00
EQUIPMENT			
EXPENDABLES	1	$50.00	$50.00
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$1,000.00
G&A – OTHER DIRECT COSTS	1000.00	0.0733	$73.30
TOTAL OTHER DIRECT COSTS			$1,073.30
SUBCONTRACT			
DRILLING	1	$8,524.00	$8,524.00
LABORATORY	1	$30,670.50	$30,670.50
SURVEY	1	$3,200.00	$3,200.00
OTHER			
SUBTOTAL SUBCONTRACT			$42,394.50
G&A – SUBCONTRACT	42394.5	0.0733	$3,107.52
TOTAL SUBCONTRACT			$45,502.02
TOTAL COST			$59,564.74
AWARD FEE – LABOR, TRAVEL, ODC	14062.72	0.1	$1,406.27
AWARD FEE – SUBCONTRACT	45502.02	0.045	$2,047.59
TOTAL PRICE			$63,018.60

TASK: Task 3 – Bi-Monthly GW Elevation Measurements
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER		$25.50	
TASK ORDER MANAGER	8	$29.00	$232.00
SENIOR ENGINEER		$29.00	
SENIOR SCIENTIST		$29.10	
ENGINEER		$18.50	
GEOLOGIST	70	$19.00	$1,330.00
HYDROLOGIST		$20.00	
TOXICOLOGIST		$18.00	
PROJECT ASSISTANT		$13.00	
CLERICAL/WORD PROCESSING		$10.00	
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR		$13.26	
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT		$19.71	
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON		$10.50	
TECHNICAL EXPERT		$35.00	
SUBTOTAL DIRECT LABOR	78		$1,562.00
OVERHEAD	1562	0.3312	$517.33
FRINGE	2079.33	0.5413	$1,125.54
G&A – LABOR	3204.87811	0.0733	$234.92
TOTAL LABOR			$3,439.80
AIRFARE			
CAR/FUEL	14	$50.00	$700.00
FIELD VAN/FUEL		$80.00	
PER DIEM	14	$26.00	$364.00
LODGING			
SUBTOTAL TRAVEL			$1,064.00
G&A – TRAVEL	1064	0.0733	$77.99
TOTAL TRAVEL			$1,141.99
PHONE & TELEX	14	$5.00	$70.00
SHIPPING			
EQUIPMENT			
EXPENDABLES	2	$50.00	$100.00
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$170.00
G&A – OTHER DIRECT COSTS	170.00	0.0733	$12.46
TOTAL OTHER DIRECT COSTS			$182.46
SUBCONTRACT			
DRILLING			
LABORATORY			
SURVEY			
OTHER			
SUBTOTAL SUBCONTRACT			
G&A – SUBCONTRACT		0.0733	
TOTAL SUBCONTRACT			
TOTAL COST			$4,764.25
AWARD FEE – LABOR, TRAVEL, ODC	4764.24787	0.1	$476.42
AWARD FEE – SUBCONTRACT		0.045	
TOTAL PRICE			$5,240.67

TASK: 4 – Lab Data Validation, Evaluation and Reporting
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER	48	$25.50	$1,224.00
TASK ORDER MANAGER	96	$29.00	$2,784.00
SENIOR ENGINEER		$29.00	
SENIOR SCIENTIST	160	$29.10	$4,656.00
ENGINEER		$18.50	
GEOLOGIST	64	$19.00	$1,216.00
HYDROLOGIST		$20.00	
TOXICOLOGIST		$18.00	
PROJECT ASSISTANT	32	$13.00	$416.00
CLERICAL/WORD PROCESSING	80	$10.00	$800.00
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR	8	$13.26	$106.08
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT	104	$19.71	$2,049.84
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON	32	$10.50	$336.00
TECHNICAL EXPERT	8	$35.00	$280.00
SUBTOTAL DIRECT LABOR	632		$13,867.92
OVERHEAD	13867.92	0.3312	$4,593.06
FRINGE	18460.98	0.5413	$9,992.93
G&A – LABOR	28453.9009	0.0733	$2,085.67
TOTAL LABOR			$30,539.57
AIRFARE			
CAR/FUEL		$50.00	
FIELD VAN/FUEL		$80.00	
PER DIEM		$26.00	
LODGING			
SUBTOTAL TRAVEL			
G&A – TRAVEL		0.0733	
TOTAL TRAVEL			
PHONE & TELEX	30	$5.00	$150.00
SHIPPING	5	$25.00	$125.00
EQUIPMENT			
EXPENDABLES			
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$275.00
G&A – OTHER DIRECT COSTS	275.00	0.0733	$20.16
TOTAL OTHER DIRECT COSTS			$295.16
SUBCONTRACT			
DRILLING			
LABORATORY			
SURVEY			
REPORT COPY AND BINDING			$219.80
SUBTOTAL SUBCONTRACT			$219.80
G&A – SUBCONTRACT	219.8	0.0733	$16.11
TOTAL SUBCONTRACT			$235.91
TOTAL COST			$31,070.64
AWARD FEE – LABOR, TRAVEL, ODC	30834.7293	0.1	$3,083.47
AWARD FEE – SUBCONTRACT	235.91	0.045	$10.62
TOTAL PRICE			$34,164.73

TASK: Task 5 – Risk Assessment and Reporting
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER		$25.50	
TASK ORDER MANAGER	72	$29.00	$2,088.00
SENIOR ENGINEER		$29.00	
SENIOR SCIENTIST	208	$29.10	$6,052.80
ENGINEER		$18.50	
GEOLOGIST		$19.00	
HYDROLOGIST		$20.00	
TOXICOLOGIST	168	$18.00	$3,024.00
PROJECT ASSISTANT	32	$13.00	$416.00
CLERICAL/WORD PROCESSING	60	$10.00	$600.00
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR		$13.26	
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT		$19.71	
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON	24	$10.50	$252.00
TECHNICAL EXPERT		$35.00	
SUBTOTAL DIRECT LABOR	564		$12,432.80
OVERHEAD	12432.8	0.3312	$4,117.74
FRINGE	16550.54	0.5413	$8,958.81
G&A – LABOR	25509.35	0.0733	$1,869.84
TOTAL LABOR			$27,379.19
AIRFARE (2 Trips–Mass. to Tall. & Jax.)	1	$1,302.00	$1,302.00
CAR/FUEL		$50.00	
FIELD VAN/FUEL		$80.00	
PER DIEM	5	$26.00	$130.00
LODGING	4	$42.00	$168.00
SUBTOTAL TRAVEL			$1,600.00
G&A – TRAVEL	1600	0.0733	$117.28
TOTAL TRAVEL			$1,717.28
PHONE & TELEX	20	$5.00	$100.00
SHIPPING	7	$50.00	$350.00
EQUIPMENT			
EXPENDABLES			
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$450.00
G&A – OTHER DIRECT COSTS	450.00	0.0733	$32.99
TOTAL OTHER DIRECT COSTS			$482.99
SUBCONTRACT			
DRILLING			
LABORATORY			
SURVEY			
REPORT COPY AND BINDING			$549.50
SUBTOTAL SUBCONTRACT			$549.50
G&A – SUBCONTRACT	549.5	0.0733	$40.28
TOTAL SUBCONTRACT			$589.78
TOTAL COST			$30,169.23
AWARD FEE – LABOR, TRAVEL, ODC	29579.45	0.1	$2,957.95
AWARD FEE – SUBCONTRACT	589.78	0.045	$26.54
TOTAL PRICE			$33,153.72

104
84
188

TASK: Task 6 – Closure Plan
PROJECT NAME: H1000 Tank System Closure
RESPONSIBLE: K. O'Neil

DESCRIPTION	BASE	RATE	AMOUNT
PROGRAM MANAGER		$36.50	
QUALITY ASSURANCE MANAGER		$25.50	
TASK ORDER MANAGER	64	$29.00	$1,856.00
SENIOR ENGINEER	40	$29.00	$1,160.00
SENIOR SCIENTIST	120	$29.10	$3,492.00
ENGINEER		$18.50	
GEOLOGIST	40	$19.00	$760.00
HYDROLOGIST		$20.00	
TOXICOLOGIST		$18.00	
PROJECT ASSISTANT		$13.00	
CLERICAL/WORD PROCESSING	56	$10.00	$560.00
ACCOUNTING		$14.00	
CONTRACT MANAGER		$19.50	
TECHNICAL EDITOR	16	$13.26	$212.16
HEALTH & SAFETY ASSISTANT		$12.50	
HEALTH & SAFETY MANAGER		$24.00	
QUALITY ASSURANCE ASSISTANT		$19.71	
CAD OPERATOR/SR DRAFTSMAN		$15.60	
DRAFTSPERSON	40	$10.50	$420.00
TECHNICAL EXPERT	8	$35.00	$280.00
SUBTOTAL DIRECT LABOR	384		$8,740.16
OVERHEAD	8740.16	0.3312	$2,894.74
FRINGE	11634.90	0.5413	$6,297.97
G&A – LABOR	17932.87	0.0733	$1,314.48
TOTAL LABOR			$19,247.35
AIRFARE			
CAR/FUEL		$50.00	
FIELD VAN/FUEL		$80.00	
PER DIEM		$26.00	
LODGING			
SUBTOTAL TRAVEL			
G&A – TRAVEL		0.0733	
TOTAL TRAVEL			
PHONE & TELEX		$5.00	
SHIPPING	7	$25.00	$175.00
EQUIPMENT			
EXPENDABLES			
OTHER			
SUBTOTAL OTHER DIRECT COSTS			$175.00
G&A – OTHER DIRECT COSTS	175.00	0.0733	$12.83
TOTAL OTHER DIRECT COSTS			$187.83
SUBCONTRACT			
DRILLING			
LABORATORY			
SURVEY			
REPORT COPY AND BINDING			$224.75
SUBTOTAL SUBCONTRACT			$224.75
G&A – SUBCONTRACT	224.75	0.0733	$16.47
TOTAL SUBCONTRACT			$241.22
TOTAL COST			$19,676.40
AWARD FEE – LABOR, TRAVEL, ODC	19435.17	0.1	$1,943.52
AWARD FEE – SUBCONTRACT	241.22	0.045	$10.86
TOTAL PRICE			$21,630.78

CLEAN FEE ITEMIZATION FORM
SOUTHDIV ENVIRONMENTAL DIVISION

SOW: 015 DATE OF SCOPE: September 20, 1991 DATE OF ESTIMATE: September 20, 1991 A&E FIRM: ABB Environmental Services, Inc. CONTRACT NO.: N62467-89-D-0317

PROJECT: Hangar 1000 Tank System Closure

FUNDING: Defense Environmental Restoration Act (DERA)

ACTIVITY: Naval Air Station Jacksonville

UIC CODE: N00207 LOCATION: Jacksonville, Florida

		OFFICE		FIELDWORK		TOTAL	
ITEM	RATE/HR.	LABOR HOURS	COST(S)	LABOR HOURS	COST(S)	LABOR HOURS	COST(S)
Program Manager	36.50		$0.00		$0.00	0	$0.00
Quality Assurance Manager	25.50	48	$1,224.00		$0.00	48	$1,224.00
Task Order Manager	29.00	328	$9,512.00		$0.00	328	$9,512.00
Senior Engineer	29.00	40	$1,160.00		$0.00	40	$1,160.00
Senior Scientist	29.10	504	$14,666.40	80	$2,328.00	584	$16,994.40
Engineer	18.50		$0.00		$0.00	0	$0.00
Geologist	19.00	104	$1,976.00	150	$2,850.00	254	$4,826.00
Hydrologist	20.00		$0.00		$0.00	0	$0.00
Toxicologist	18.00	168	$3,024.00		$0.00	168	$3,024.00
Program Assistant	13.00	104	$1,352.00		$0.00	104	$1,352.00
Clerical/Word Processing	10.00	196	$1,960.00		$0.00	196	$1,960.00
Accounting	14.00		$0.00		$0.00	0	$0.00
Contract Manager	19.50		$0.00		$0.00	0	$0.00
Technical Editor	13.26	24	$318.24		$0.00	24	$318.24
Health & Safety Assistant	12.50		$0.00		$0.00	0	$0.00
Health & Safety Manager (CIH)	24.00		$0.00		$0.00	0	$0.00
Quality Assurance Assistant	19.71	104	$2,049.84		$0.00	104	$2,049.84
Cad Operator/Sr. Draftsperson	15.60		$0.00		$0.00	0	$0.00
Draftsperson	10.50	104	$1,092.00		$0.00	104	$1,092.00
Air Quality Engineer/Scientist	16.94		$0.00		$0.00	0	$0.00
Senior Hydrologist	33.79		$0.00		$0.00	0	$0.00
Senior Chemist (CLP Qual.)	22.44		$0.00		$0.00	0	$0.00
Chemist	16.35		$0.00		$0.00	0	$0.00
Computer Programmer	19.71		$0.00		$0.00	0	$0.00
Senior Contract Manager	28.50		$0.00		$0.00	0	$0.00
Technical Expert (PhD-Sci/Eng)	35.00	16	$560.00		$0.00	16	$560.00
TOTAL DIRECT LABOR	XXXXX	1,740	$38,894.48	230	$5,178.00	1,970	$44,072.48
X Fringe (.3312)	XXXXX	XXXXX	$12,881.85	XXXXX	$1,714.95	XXXXX	$14,596.81
X Overhead (.5413)	XXXXX	XXXXX	$28,026.53	XXXXX	$3,731.15	XXXXX	$31,757.69
X G&A (.0733)	XXXXX	XXXXX	$5,849.55	XXXXX	$778.75	XXXXX	$6,628.30
Total Burdened Dir. Labor	XXXXX	XXXXX	$85,652.41	XXXXX	$11,402.85	XXXXX	$97,055.28

PART II - OTHER DIRECT COSTS (Itemized on Supplement Sheets)

ITEM	UNIT COST(S)	QUANTITY	TOTAL
Telephone/Communications	$5.00/call	86	430.00
Postage/Freight	See attached sheet		1,550.00
Expendables	See attached sheet		150.00
Subtotal			2,130.00
X G&A (.0733)			156.13
TOTAL	XXXXXXX	XXXXXXX	2,286.13

PART III - TRAVEL (Itemized on Supplement Sheets)

Per Diem	See attached sheet		754.00
Car/Van Rental and Fuel	See attached sheet		1,500.00
Airfare	See attached sheet		1,302.00
Lodging	See attached sheet		546.00
Subtotal			4,102.00
X G&A (.0733)			300.68
TOTAL TRAVEL EXPENSES	XXXXX	XXXXX	4,402.68

PART IV - SUBCONTRACTOR SERVICES (Itemized on Supplement Sheets)

Drilling	See attached sheet		8,524.00
Laboratory	See attached sheet		30,670.50
Survey	See attached sheet		3,200.00
Coping and Binding	See attached sheet		994.05
Subtotal			$43,388.55
X G&A (.0733)			$3,180.38
TOTAL SUBCONTRACTOR EXPENSES	XXXXX	XXXXX	$46,568.93

	TOTAL	
	LABOR HOURS	COST(S)
TOTAL PART I (Direct Labor)	1970	97,055.28
TOTAL PART II (Other Direct Costs)		2,286.13
TOTAL PART III (Travel Expenses)		4,402.68
SUBTOTAL (Parts I, II, & III)		103,744.09
Award Fee Pool @ 10 % x Parts I, II, & III Enter Award Fee % here 10 %		10,374.41
Parts I, II, & III TOTAL		114,118.50
TOTAL PART IV (Subcontractor Expenses)		46,568.93
Award Fee Pool @ 4.5 % x Part IV Enter Award Fee % here 4.5 %		$2,095.60
Part IV TOTAL		$48,664.53
TOTAL: (Parts I, II, & III)		114,118.50
(Part IV)		$48,664.53
GRAND TOTAL		162,783.03

A&E Signature	Date	Telephone	
James R Wallace	9/25/91		
EIC Signature	**Date** / **Code**	**Code 18C Approval**	**Date**